

## ABSTRACT

A modified human TNF $\alpha$  molecule is capable of raising neutralizing antibodies towards unmodified human TNF $\alpha$  following administration of the modified TNF $\alpha$  to a human host, wherein one or more peptide fragments of the human TNF $\alpha$  molecule has been substituted by one or more peptides containing immunodominant T cell epitopes or a truncated form of the molecule containing the immunodominant epitope and one or both flanking regions of the human TNF $\alpha$ -molecule containing at least one TNF $\alpha$  B cell epitope, wherein the substitution introduces a substantial change in the amino acid sequence of any one of the strands of the front  $\beta$ -sheet, in any one of the connecting loops, or in any one of the B', I, or D strands of the back  $\beta$ -sheet.